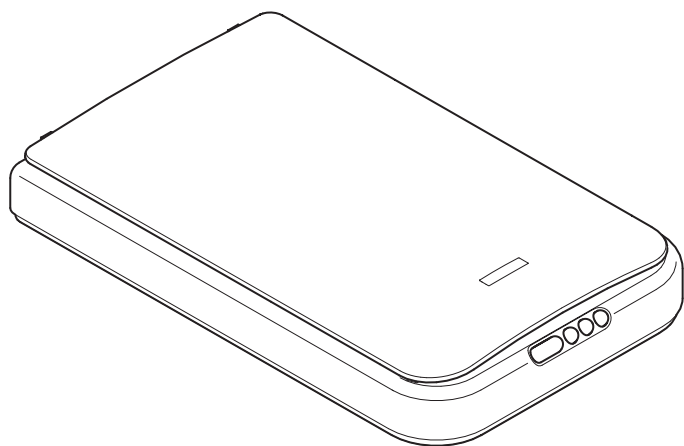


# Service Manual



**EPSON Perfection 1250/1250 PHOTO**



**EPSON®**

TM-PERF1250  
Printed in U.S.A.



**EPSON®**

**Perfection 1250/1250 PHOTO Color Flatbed Scanner  
Service Manual**

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## **FCC Compliance Statement for American Users**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- ☐ Reorient or relocate the receiving antenna.
- ☐ Increase the separation between the equipment and receiver.
- ☐ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ☐ Consult the dealer or an experienced radio/television technician for help.

### **Warning**

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the printer.

### **For Canadian Users**

This Class B digital apparatus meets all requirements of the Canadian Interface-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Guide to Using This Manual

Before servicing the EPSON Perfection 1250/1250 PHOTO, read the precautions on the following page. Then turn to one of these chapters:

### Chapter 1. Product Basics

*Lists the main features of the product and describes basic control panel operations.*

### Chapter 2. Technical Overview

*Explains how the product works.*

### Chapter 3. Troubleshooting

*Tells how to identify and correct common problems.*

### Chapter 4. Disassembly and Assembly

*Provides step-by-step instructions for disassembling the product.*

### Chapter 5. Maintenance

*Describes routine maintenance procedures.*

### Chapter 6. Appendix

*Provides additional information for reference:*

- Detailed specifications
- Connector diagram and pin assignments
- Electrical diagrams
- Parts list
- Exploded diagrams

### Symbols Used in This Manual



**Warnings** must be followed to avoid personal injury or death.



**Cautions** must be followed to avoid damaging the scanner.



**Reassembly** notes provide helpful information for reassembly.



**TIP** notes provide helpful tips for reassembly.

## General Precautions



- When servicing, unplug the scanner from the power outlet and disconnect any attached devices.
- Never touch the primary parts of the power supply when the scanner is plugged in. The scanner's primary circuitry remains live whenever it is plugged in.
- No work should be performed on the unit by persons unfamiliar with basic safety measures familiar to trained electronics technicians.
- When performing testing or troubleshooting procedures in this manual, do not connect the unit to a power source until instructed to do so. When the power supply cable must be connected, use extreme caution in working on the power supply board and other electronic components.



- Repairs on EPSON products should be performed only by an EPSON-certified repair technician.
- Make certain that the source voltage is the same as the rated voltage listed on the serial number/rating plate. If the EPSON product has a primary AC rating different from the available power source, do not connect it to the power source.
- Always verify that the EPSON product has been disconnected from the power source before removing or replacing circuit boards and other components.
- To protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
- Always replace malfunctioning components with EPSON components. Introduction of second-source ICs or other non-approved components may damage the product and void any applicable EPSON warranty.



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**CHAPTER**

**1**

# **PRODUCT BASICS**





## 1.1 Features

There are two EPSON Perfection 1250 models: the 1250 and the 1250 PHOTO. The Perfection 1250 PHOTO ships with a TPU (transparency unit) as a standard feature. Both models are flat-bed color image scanners capable of scanning up to A4 size documents (maximum scan area: 8.5 × 11.7 inch).

The scanner's features include:

### High resolution

- ☐ Optical resolution up to 1200 dpi  
(1200 dpi in the main scan direction, 2400 dpi in the sub-scan direction)
- ☐ Maximum effective pixels:  
10,200 × 14,040
- ☐ Output resolution:  
50 to 4800 dpi

### Compact and lightweight

- ☐ The world's thinnest 1200 dpi CCD scanner.

### High-speed scanning

- ☐ At 1200 dpi, the scanner performs at the following speeds:

**Table 1-1. Scan Speed**

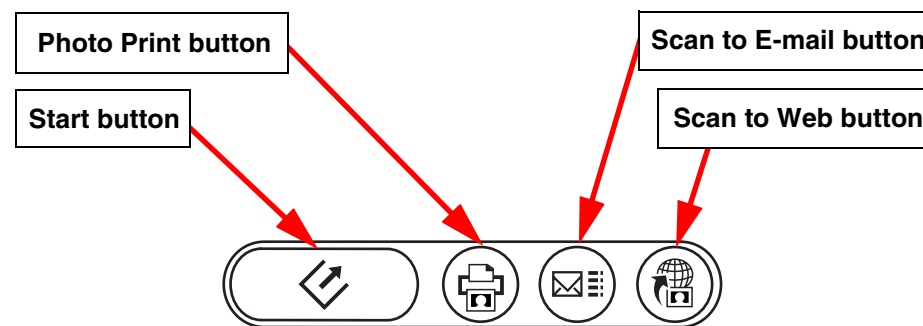
Setting	Speed
Monochrome (B&W)	Approx. 12 msec per line
256 Grayscale	Approx. 36 msec per line
Full Color	Approx. 36 msec per line

### Command level

- ☐ ESC/I-D2

## 1.2 Control Panel

The control panel includes four buttons, as shown below:



**Figure 1-1. Control Panel buttons**

### Buttons

The four buttons (Start, Photo Print, Scan to E-mail, Scan to Web) on the control panel can be used in conjunction with the scanner software to make scanning very easy.

- ☐ **Start**  
Starts EPSON Smart Panel (button function can be reassigned).
- ☐ **Photo Print**  
Starts Photo Print, scans and prints the document.
- ☐ **Scan to E-mail**  
The document is scanned in Full Auto mode and the image file is automatically attached to an e-mail message.
- ☐ **Scan to Web**  
Sends the image to the EPSON Photo Sharing web site.

**Indicator Lights**

- ☐ Ready (green)  
Lit when the scanner is ready to receive commands. Flashes when data is sent to or from the host computer.
- ☐ Error (red)  
Lit when an error occurs.

**CHAPTER**

**2**

## **TECHNICAL OVERVIEW**

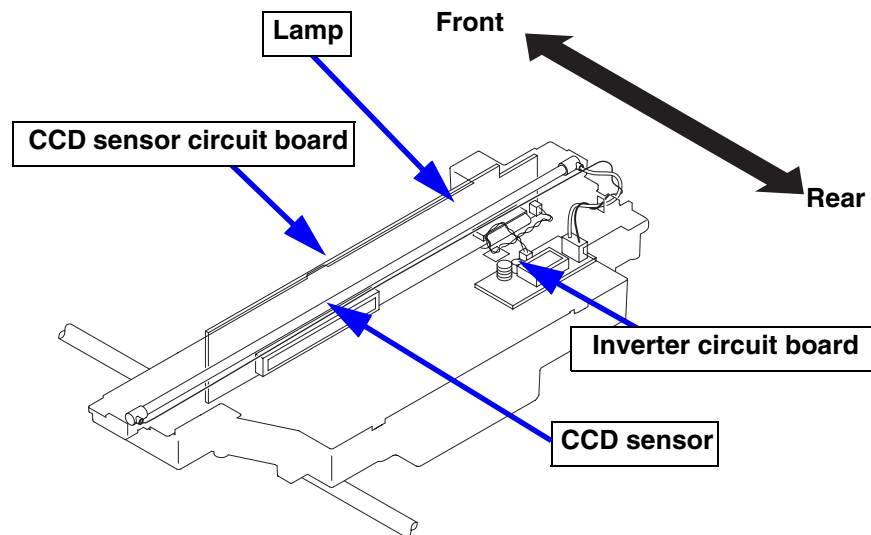


## 2.1 Basic Operation

This chapter describes the basic operation of the Perfection 1250/1250 PHOTO engine.

### 2.1.1 Carriage Assembly

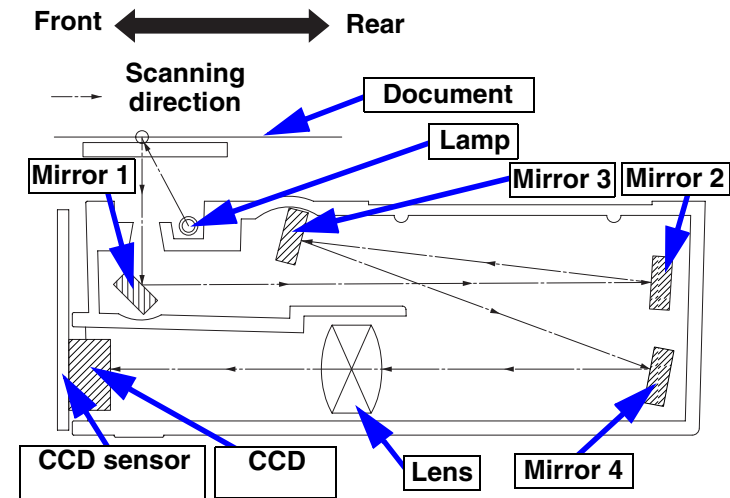
The carriage assembly consists of a CCD sensor circuit board, an inverter circuit board, a lamp (light source), and a mirror and lens mechanism.



**Figure 2-1. Carriage Assembly Structure**

- **CCD sensor circuit board**  
This board consists of color CCD line sensors (independent R, G and B) and circuits for controlling them.
- **Inverter circuit board**  
This board boosts the power supply voltage to +24 V DC and converts it from direct current to alternating current in order to drive the lamp (cold-cathode fluorescent lamp).
- **Lamp**  
A cold-cathode fluorescent lamp is used as the light source.

- **Mirror and lens mechanism**  
The light that illuminates the document being scanned is reflected to the mirror and lens mechanism inside the carriage unit. The CCD sensor separates R, G and B components.



**Figure 2-2. Mirror and Lens Mechanism**

## 2.1.2 Carriage Mechanism

To generate an image, the document is scanned in the main scanning direction (single line scan) by the CCD sensor, and then in the sub-scanning direction (multiple line scan) by the carriage assembly as shown in Figure 2-3.

The color CCD sensor can only scan a single line in the main scanning direction (which runs parallel to the carriage assembly direction). In order to scan the second and subsequent lines in the sub-scanning direction, the CCD sensor is moved by the carriage unit. Scanned data is then sent to the control circuit board. When line  $n$  is being scanned, the image data for line  $n-1$  is processed at the same time, so that scanning is continuously carried out.

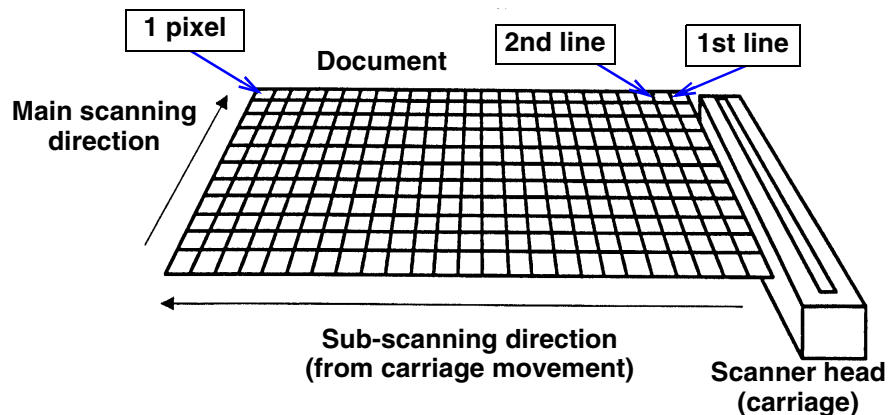


Figure 2-3. Carriage Movement

The carriage assembly slides along the guide rail in the sub-scanning direction. This movement is powered by the CR motor via the drive pulley to the timing belt which is secured to the carriage unit. The scanning starting position is determined by the CR HP sensor, which is located on the control circuit board.

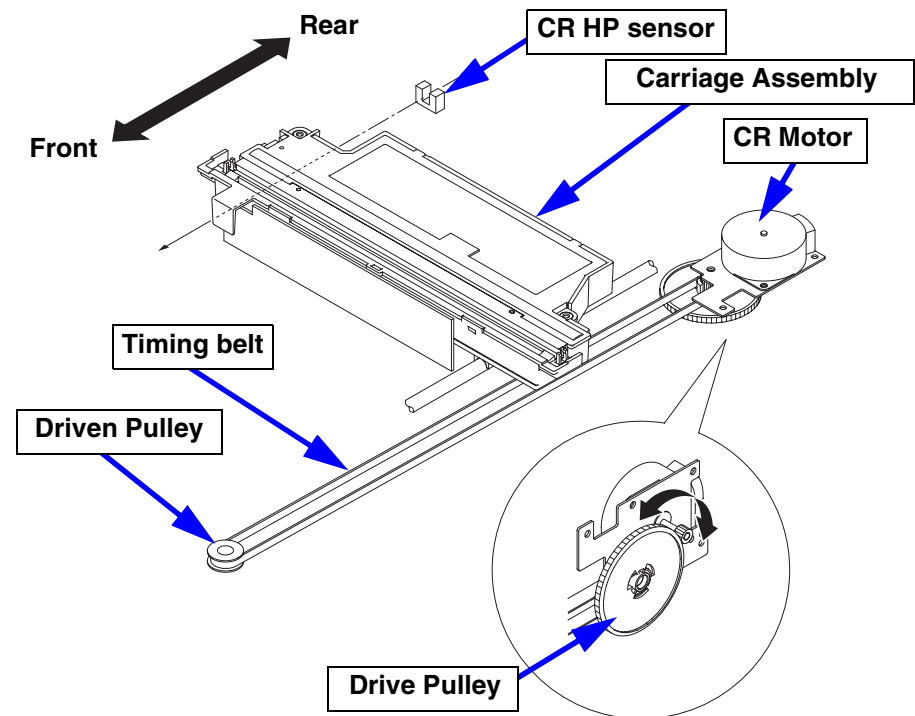


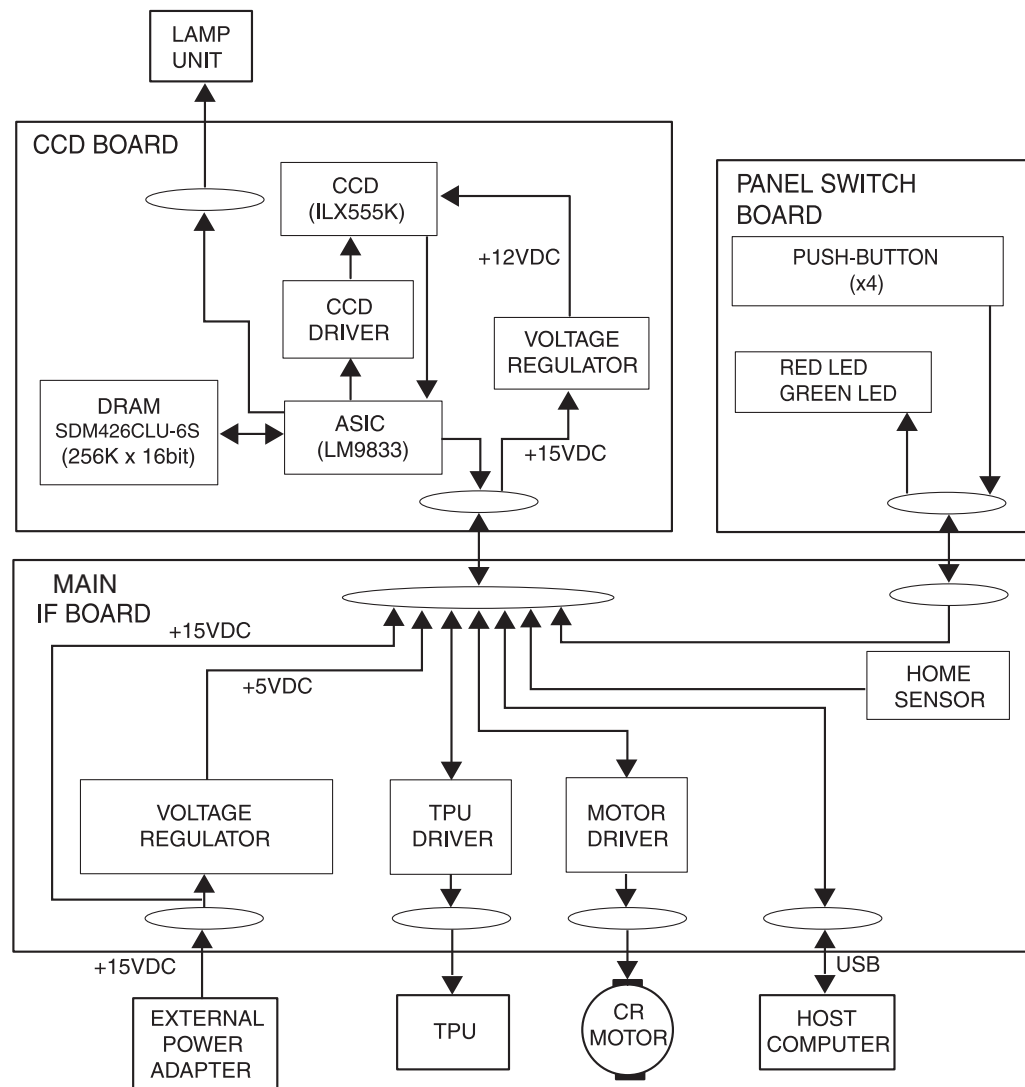
Figure 2-4. Carriage Operation

## 2.2 Control Circuit Overview

The scanner uses a single-chip, 16-bit bus CPU (IC16) which has a transmission frequency of 20 MHz. Input image signal correction, image processing and CCD sensor control are controlled by the ASIC (IC10). Table 2-1 describes each of the main ICs function.

**Table 2-1. Description of Main ICs**

IC	Location	Function
T224162B-35J	IC1	DRAM 256 x 16bit
NM24C02M8X	IC2	Reset IC
ILX555K	IC4	CCD
LM9833	IC5	ASIC : Manages the following <ul style="list-style-type: none"> <li>• CCD control</li> <li>• Image processing</li> <li>• USB 1.1 Interface</li> <li>• Stepping motor control</li> <li>• Input image signal correction</li> <li>• General-purpose I/O</li> <li>• Programmable frequency divider</li> <li>• Buffer control</li> </ul>
NJM78M120LA-TE1	IC7	Regulator
PC1	RPI-576	CR home position sensor
SW1.2.3.4	CARBON SWITCH	Push Switch
LED1	SML-020MLT	LED Ready : Green Error : Red

**Figure 2-5. Control Circuit Block Diagram**



**CHAPTER**

**3**

# **TROUBLESHOOTING**



## 3.1 Overview

---

Follow these steps to troubleshoot the scanner:

1. Run a scan through the user interface and note which indicator lights are on. Then determine their meaning in [Scanner Self-Diagnostics](#) on page 24, and try the remedy provided.
2. If that doesn't work, see [Unit-Level Troubleshooting](#) on page 24.

## 3.2 Error Processing

---

### Fatal errors

- ☐ Cause
  - Blown bulb (illumination is low)
  - Carriage does not return to home position
  - Other Scanner malfunction
- ☐ Process
  - Lamp turns off and operation stops
  - A status Bit 7 is set
- ☐ Display
  - LED lights red
- ☐ Reset
  - After removing the cause of the error:
    - Turn the power back on
    - Disconnect and then re-connect the USB cable
    - Send ESC @
- ☐ Receivable commands
  - [ESC F, ESC f, ESC @]

### 3.3 Scanner Self-Diagnostics

When an error occurs, the scanner uses its Error and Ready indicator lights to display the type of error.

See the table below to determine the type of error:

**Table 3-1. LED Indicators and Error Type**

Red LED	Error Type
On	<ul style="list-style-type: none"> <li>■ Blown lamp</li> <li>■ Carriage does not return to the home position</li> <li>■ Other scanner malfunction</li> </ul>

**Remedy:** Turn the power off and back on, send an initialization command (ESC @), and disconnect then reconnect the USB cable. If the light remains red, continue with the Unit-Level Troubleshooting section.

**Acceptable commands:** ESC F, ESC f, ESC @

### 3.4 Unit-Level Troubleshooting

Refer to one of these sections to solve scanner problems:

- ☐ [Scanner Doesn't Initialize](#) on page 25
- ☐ [Carriage Doesn't Move](#) on page 25
- ☐ [Carriage Operates But an Error Occurs](#) on page 25
- ☐ [Lamp Does Not Come On](#) on page 25
- ☐ [Image Isn't Scanned Clearly](#) on page 25
- ☐ [Scanner Doesn't Receive Data From Computer](#) on page 26
- ☐ [Optional TPU Doesn't Operate](#) on page 26

---

**SCANNER DOESN'T INITIALIZE**

---

When the scanner is powered up and connected to a computer with the driver installed, the Operate light (LED) should come on, the carriage should move briefly to the right and then return to home position. If you don't see this, check the following:

1. Make sure all connectors, especially on the power supply board, are secure.
2. If all connectors are secure, go to the following section.

---

**CARRIAGE DOESN'T MOVE**

---

If the carriage does not move at all when connected to a computer with the driver installed, check the following:

1. Make sure that CN4 is connected to the main board.
2. With software installed and after starting a scan, check that the carriage slides smoothly. If it catches or fails to move smoothly, replace it.
3. Check the carriage motor for a possible short circuit or open in one of its coils. Disconnect CN5 and check resistance:
  - between pins 1 and 3: 18.4 ohms
  - between pins 2 and 4: 18.4 ohms

Replace the motor if defective.

4. If you can't find any other problems, replace the main board.

---

**CARRIAGE OPERATES BUT AN ERROR OCCURS**

---

If the carriage operates but the scanner detects an error:

1. If the upper case has been removed, reinstall it.
2. If the error still occurs, replace the main board.

---

**LAMP DOES NOT COME ON**

---

If the fluorescent lamp doesn't come on, check the following:

1. Check all connections to make sure they're secure.
2. The lamp or inverter board may be worn out. Replace the CR assembly.
3. If the lamp still doesn't come on, replace the main board.

---

**IMAGE ISN'T SCANNED CLEARLY**

---

If the image appears blurry, out of focus, or has other problems, check the following:

1. Check the document glass. Clean it if necessary with a soft, dry cloth. You can also use a neutral cleaning agent, then wipe it dry.
2. Check the lamp; it may be dirty or darkened in some areas. Clean or replace as needed.
3. Check the mirror in the carriage unit; clean it if needed.
4. If the scanner's parts are clean and you still don't get a good image, replace the main board and retest.
5. After eliminating all other possibilities, there may be an optical problem in the carriage, mirror unit, or CCD sensor unit. In that case, replace the entire scanner mechanism.

---

**SCANNER DOESN'T RECEIVE DATA FROM COMPUTER**

---

If the scanner doesn't seem to receive data, check the following:

1. Make sure the USB controller is enabled. To do so:
  - a. Start Windows.
  - b. Select My Computer, click the right mouse button and choose Properties.
  - c. Click Device Manager and make sure Universal Serial Bus Controller is enabled.
2. The TWAIN driver user interface is not installed correctly. Try removing it through the Add/Remove Programs icon in the Windows Control Panel, then reinstall it.
3. The USB cable may be defective. Try replacing it.
4. If all other possibilities are eliminated, try replacing the main board.

---

**OPTIONAL TPU DOESN'T OPERATE**

---

If the optional TPU doesn't operate, check the following:

1. Make sure CN6 is properly connected to the main board.
2. Check to see if the TPU is receiving power. Check the voltage of the lamp. It should be 24 volts. Check the voltage of the sensor circuit. It should be 5 volts. Replace the TPU as necessary.
3. Replace the main board if the TPU still doesn't operate.

**CHAPTER**

**4**

# **DISASSEMBLY & ASSEMBLY**





## 4.1 Overview

Follow the steps in this chapter to disassemble and assemble the scanner. Unless otherwise noted, you can reassemble the scanner by following the disassembly steps in reverse.

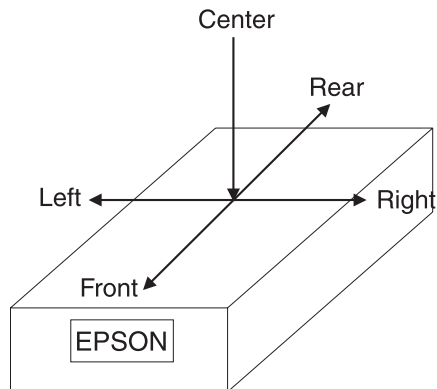


- **Unplug the scanner from the AC power outlet before servicing.**
- **Wear gloves and use an anti-static device such as a wrist strap when servicing the scanner.**



- **Perform servicing only on flat, stable surfaces.**
- **Use only the specified tools when servicing the scanner.**

The scanner directions referred to in the disassembly procedures are as follows.



**Figure 4-1. Direction Definitions**

### 4.1.1 Required Tools

Use the following tools when servicing the scanner:

**Table 4-1. Tool List**

Description	Availability
Phillips Screwdrivers (No. 1 and No. 2)	commercially available
Flat-tipped screwdriver	commercially available
Needlenose pliers	commercially available
Tweezers	commercially available
Loctite™ (screw lock fluid)	commercially available



### 4.1.2 Screws

See the tables below if you've forgotten where to put a particular screw. Screws are referred to by number throughout the disassembly instructions.

**Table 4-2. Screw Name Abbreviations**

Abbreviation	Screw Name
CBP	P-type cross-head binding screw
CBB	B-type cross-head binding screw

**Table 4-3. List of Screw Types**

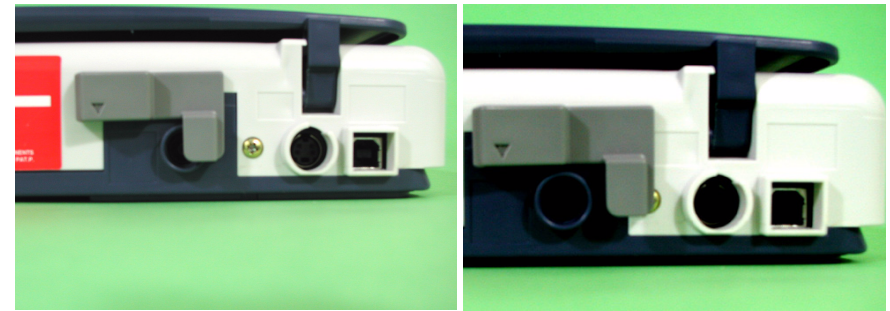
No.	Specification	Shape
1	CBP(M3x8)	
2	CBB(M2.5x12)	

## 4.2 Disassembly Procedures

This section describes the disassembly and removal procedures for each major component of the scanner.

### 4.2.1 Carriage Lock Release

1. Disconnect the power cable from the scanner.
2. Make sure the carriage lock at the rear of the scanner is in the released position.



Locked Position

Released Position

**Figure 4-2. Carriage Lock Position**



Before relocking the carriage to transport the scanner, make sure that the carriage is in the home position.

## 4.2.2 Document Cover

1. Open the document cover.
2. Holding it by its edges, lift the document cover straight up to remove it.

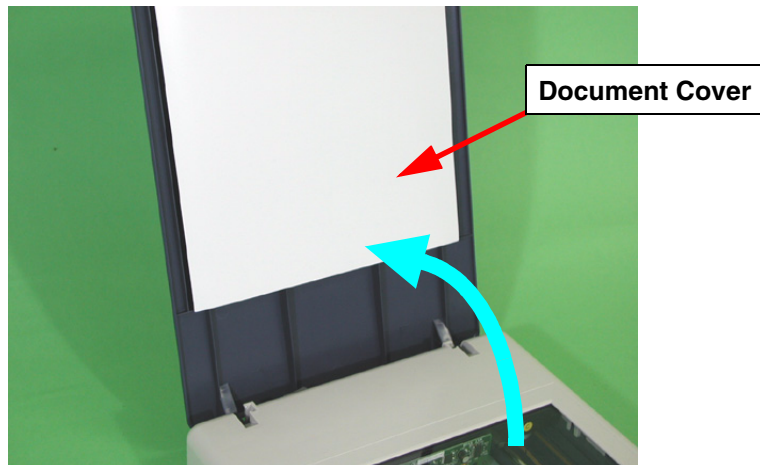


Figure 4-3. Document Cover Removal



Figure 4-4. Document Cover Removal

## 4.2.3 Upper Cover Removal

### Preparation:

- Remove the document cover as described in the previous section.
- Move the carriage lock to the locked position as described in [Carriage Lock Release](#) on page 30.

1. Remove two screws (CBP, M3x8) from the rear of the scanner.
2. Disengage the six hooks at the left and right of the cover (use a flat-tipped screwdriver or similar tool to work the cover upward), then lift the back of the upper cover and push it forward to remove it.



- When removing the upper cover, make sure that the hooks are fully disengaged and that the tabs do not get broken.
- The edges of the metal shields are sharp, so be careful during disassembly and reassembly.

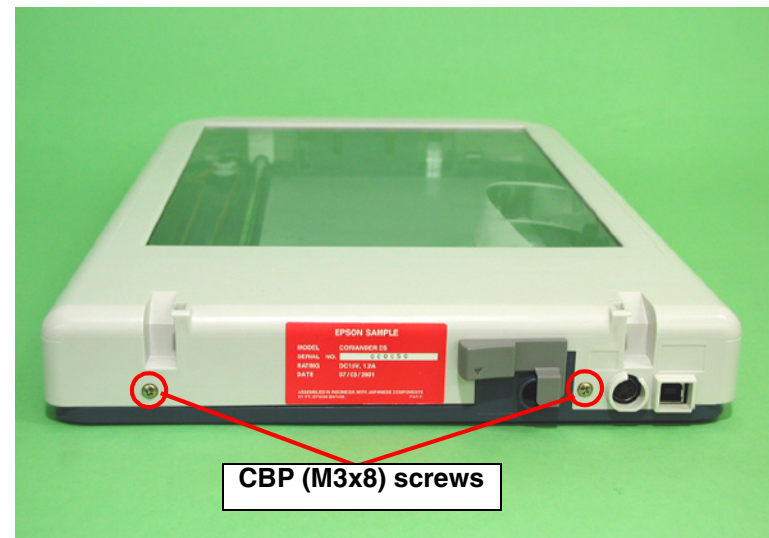


Figure 4-5. Upper Cover Removal - Remove Rear Screws

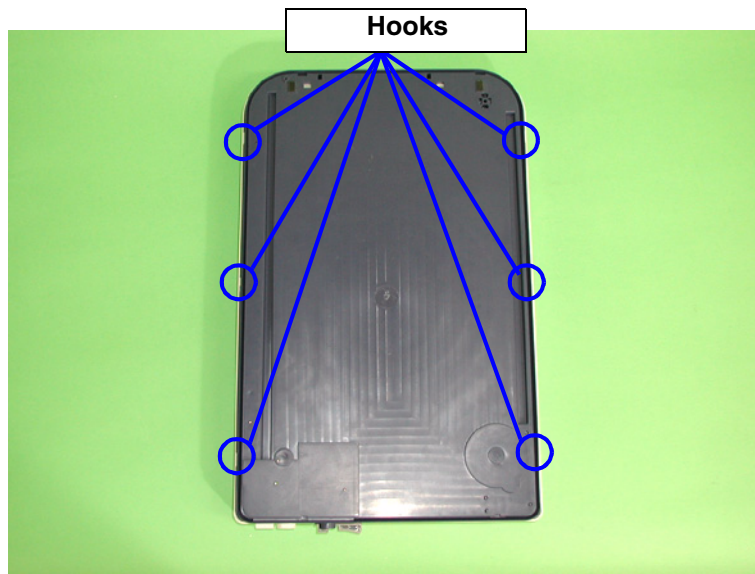


Figure 4-6. Upper Cover Removal - Disengage Hooks

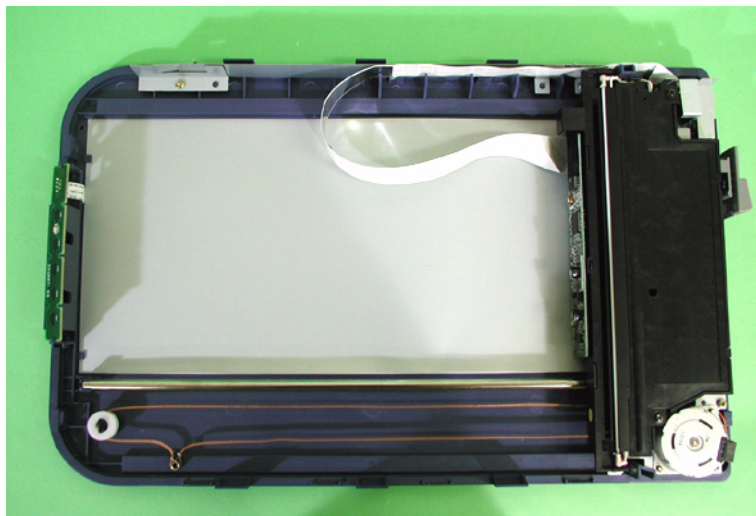


Figure 4-7. View With Upper Cover Removed

## 4.2.4 Carriage Assembly Removal

### Preparation:

- Remove the document cover as described in [Document Cover](#) on page 31.
  - Release the carriage as described in [Carriage Lock Release](#) on page 30.
1. Remove one screw (CBB, M2.5x12), and then remove the driven pulley to loosen the timing belt.
  2. Remove the CR Shaft from the holder.
  3. Remove the timing belt from the carriage assembly.
  4. Disconnect the white ribbon cable from the main circuit board.

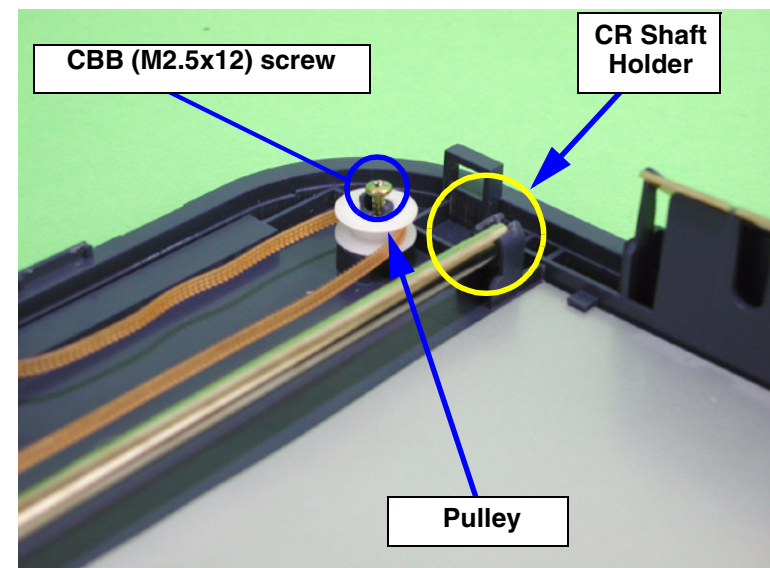


Figure 4-8. Carriage Assembly Removal (1)



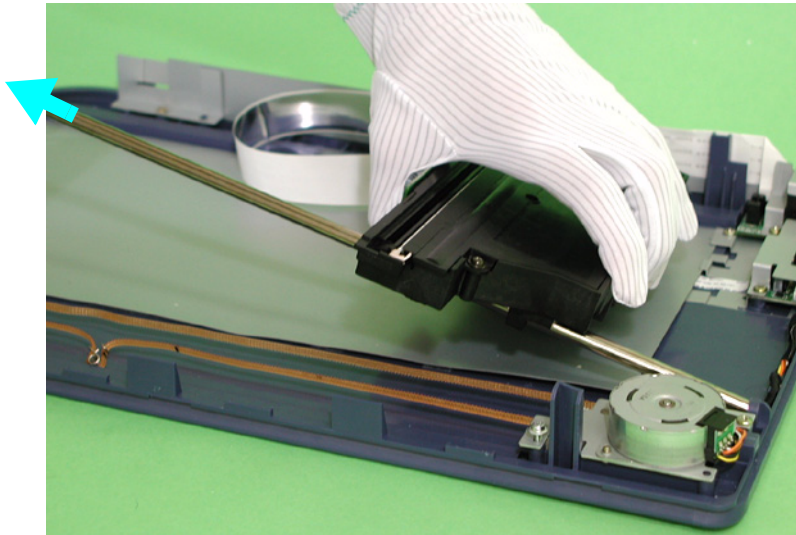


Figure 4-9. Carriage Assembly Removal (2)

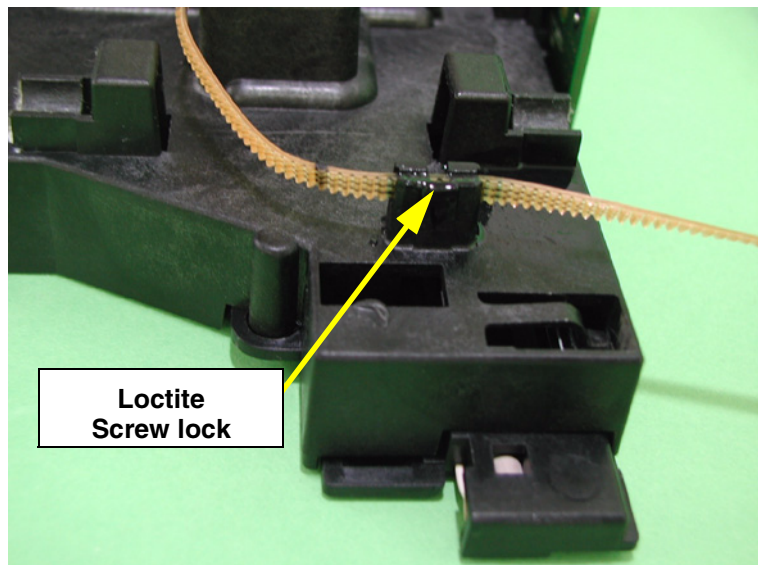


Figure 4-10. Timing Belt Removal



When attaching the timing belt to the carriage assembly, Loctite screw lock should be used.



When applying the Loctite screw lock, turn the carriage assembly upside down so that the Loctite screw lock does not get onto any other parts.

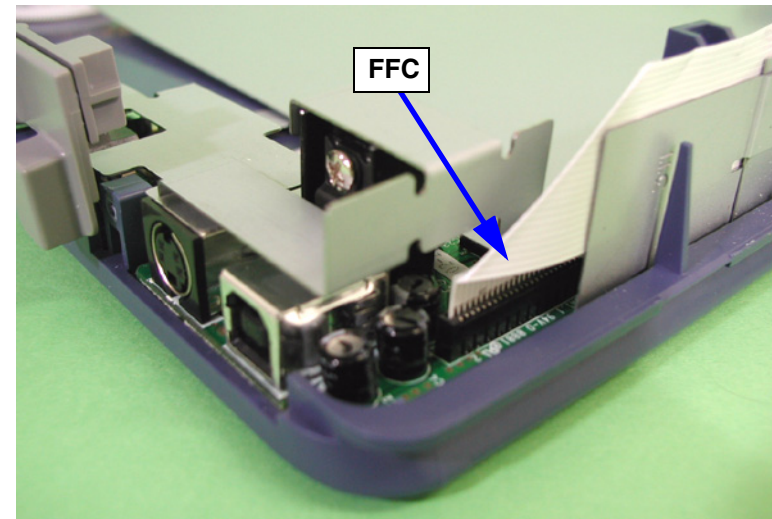


Figure 4-11. Remove FFC from Main Circuit Board

## 4.2.5 Motor CR/Timing Belt Removal

### Preparation:

- Remove the document cover as described in [Document Cover](#) on page 31.
  - Remove the upper cover as described in [Upper Cover Removal](#) on page 31.
  - Release the carriage as described in [Carriage Lock Release](#) on page 30.
  - Remove the carriage assembly as described in [Carriage Assembly Removal](#) on page 32.
1. Remove two screws (CBP, M3x8) securing the main board shield plate, and then remove the main circuit board shield plate.
  2. Remove three screws (CBP, M3x8) securing the CR motor unit.
  3. Disconnect the CR motor unit cable from the main circuit board connector (CN5), and then remove the CR motor unit.

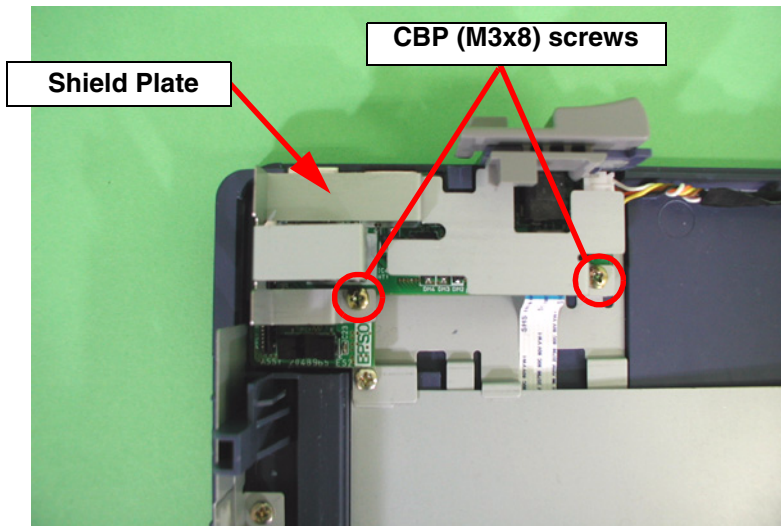


Figure 4-12. Main Circuit Board Shield Plate Removal

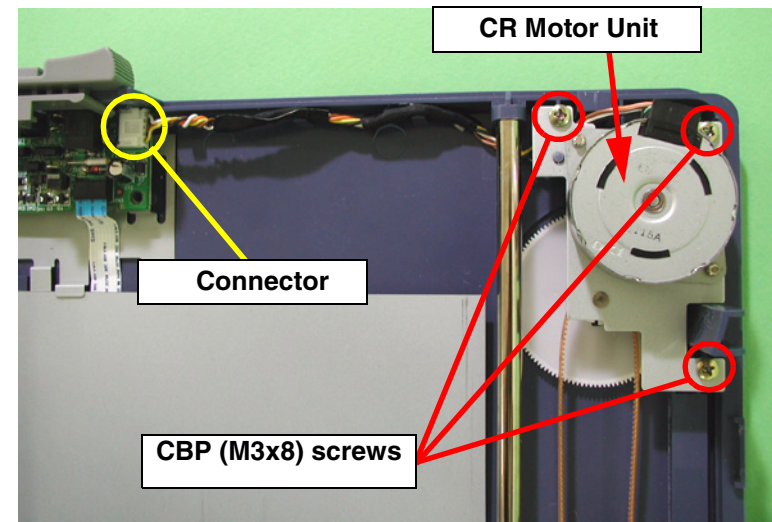


Figure 4-13. Motor CR Unit Removal

4. Remove the timing belt from the CR motor unit.
5. Remove the E-ring of the drive pulley.
6. Remove the drive pulley.



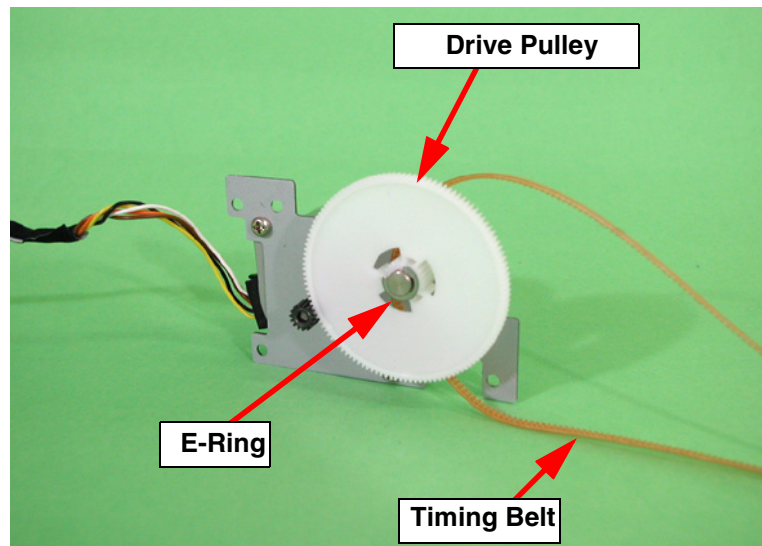


Figure 4-14. Timing Belt Removal

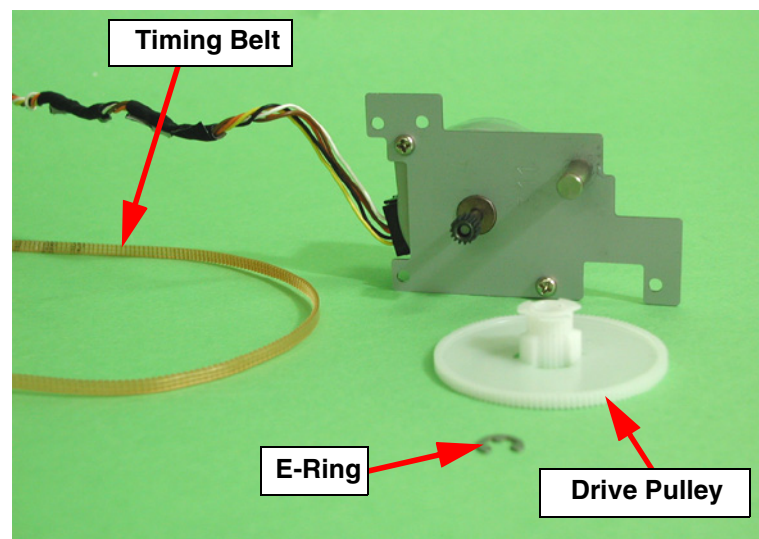


Figure 4-15. CR Motor Unit

## 4.2.6 Main Circuit Board Removal

### Preparation:

- Remove the document cover as described in [Document Cover](#) on page 31.
  - Remove the upper cover as described in [Upper Cover Removal](#) on page 31.
  - Release the carriage as described in [Carriage Lock Release](#) on page 30.
1. Gently slide the carriage assembly forward until the main circuit board shield plate can be seen.
  2. Remove two screws (CBP, M3x8) securing the main circuit board shield plate, and then remove it.
  3. Disconnect the cables from the CR motor connector (CN5), carriage ribbon cable connector (CN4) and control panel connector (CN3).
  4. Remove the main circuit board.

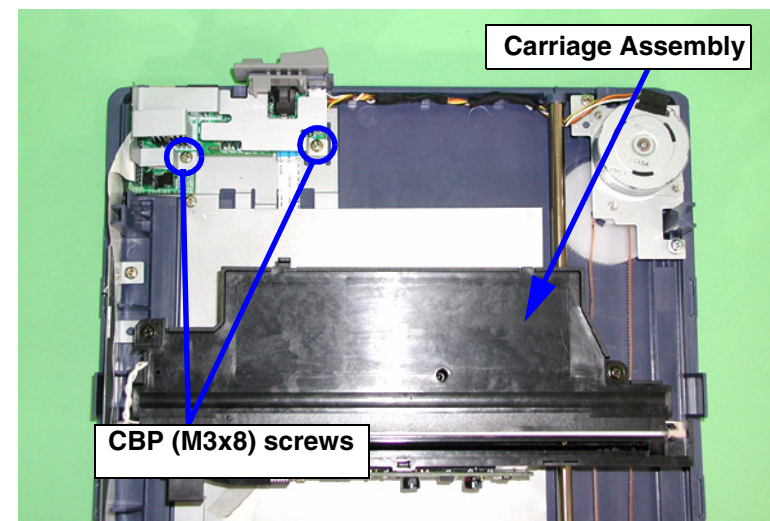


Figure 4-16. Main Circuit Board Removal

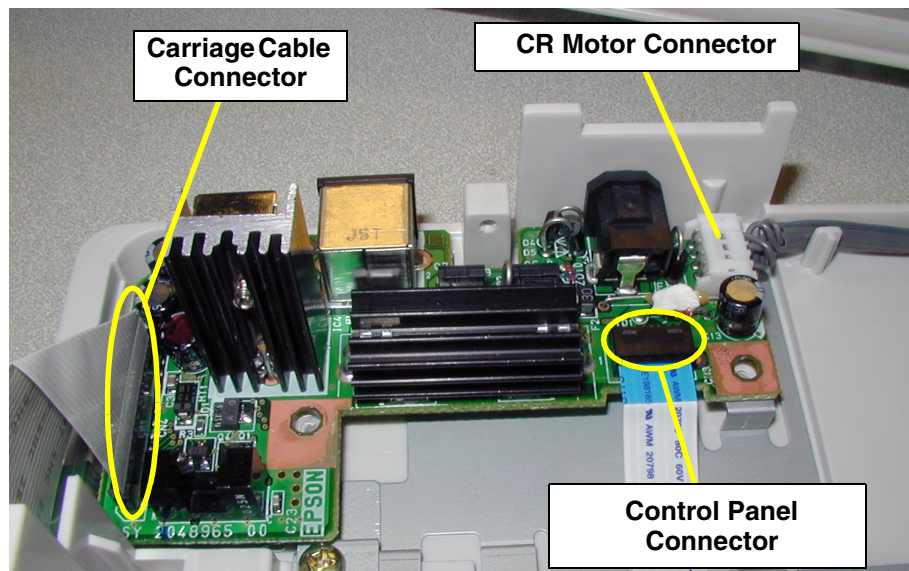


Figure 4-17. Main Circuit Board Removal

## 4.2.7 Control Panel Board Removal

### Preparation:

- Remove the document cover as described in [Document Cover](#) on page 31.
  - Remove the upper cover as described in [Upper Cover Removal](#) on page 31.
1. Disconnect the cable from CN1, disengage the two hooks, and then remove the control panel board.

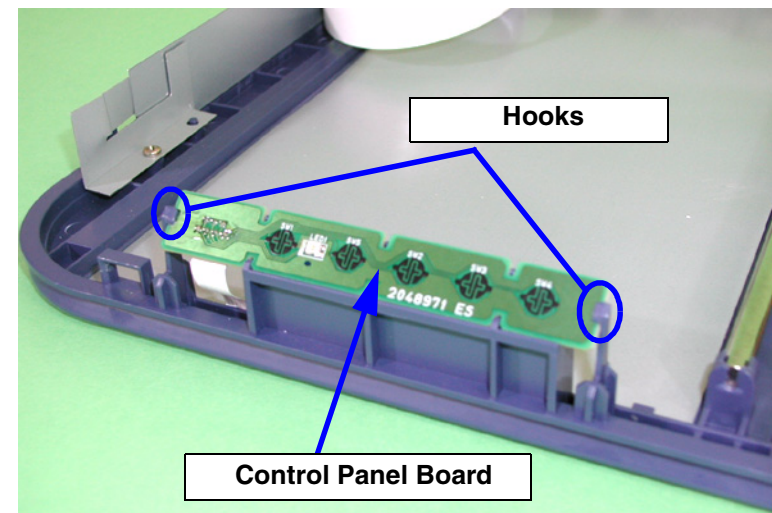


Figure 4-18. Control Panel Board Removal



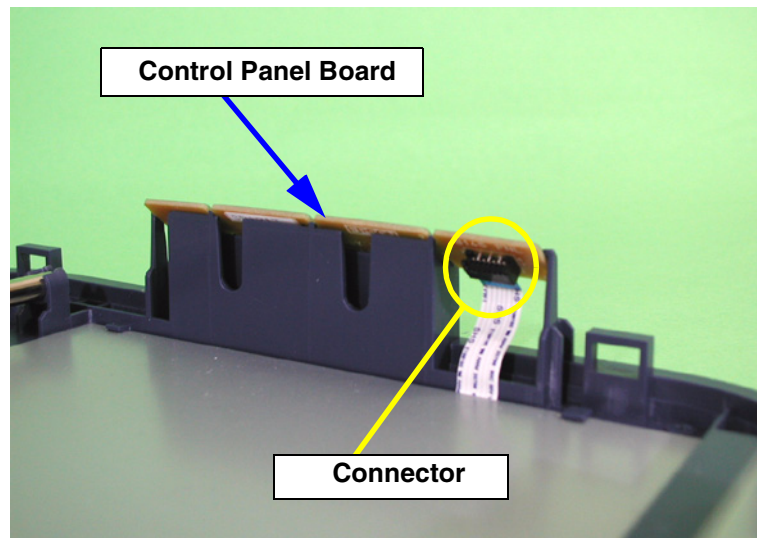


Figure 4-19. Control Panel Board Removal



**CHAPTER**

**5**

# **MAINTENANCE**



## 5.1 Overview

Perform cleaning when dirt is noticeable or affects the quality of scanned images.

### ❑ Document Glass

Clean with a soft, dry cloth. If necessary, you may use a neutral detergent, and then wipe it dry.

### ❑ Outer Case

Clean with a slightly moistened cloth. To remove stubborn stains, use a neutral detergent.

#### CAUTION



**Never use organic solvents such as thinner or benzene to clean the scanner.**

### 5.1.1 Lubrication

You need to lubricate the carriage assembly if you have replaced it or it begins making abnormal noise. Refer to the following tables for recommended grease type and application points.

**Table 5-1. Recommended Grease**

Grease Type	Contents	Part Number	Availability
G-26	40g	B702600001	EPSON product; not commercially available

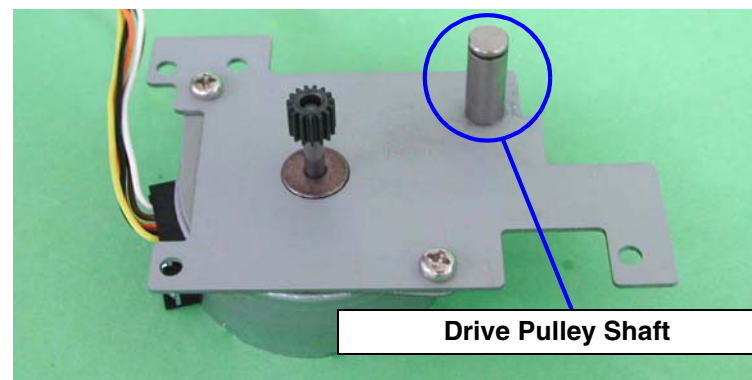
**Table 5-2. Lubrication Points**

Figure	Lubrication Points	Lubrication
5-1	Drive pulley shaft	G-26 (1.0x3mm)
5-2	Tensioning pulley shaft	G-26 (1.0x3mm)
5-3	CR shaft	G-26 (1.0x3mm)

#### CAUTION



**Excessive lubrication may cause damage to the carriage mechanism.**



**Figure 5-1. Lubrication Point**

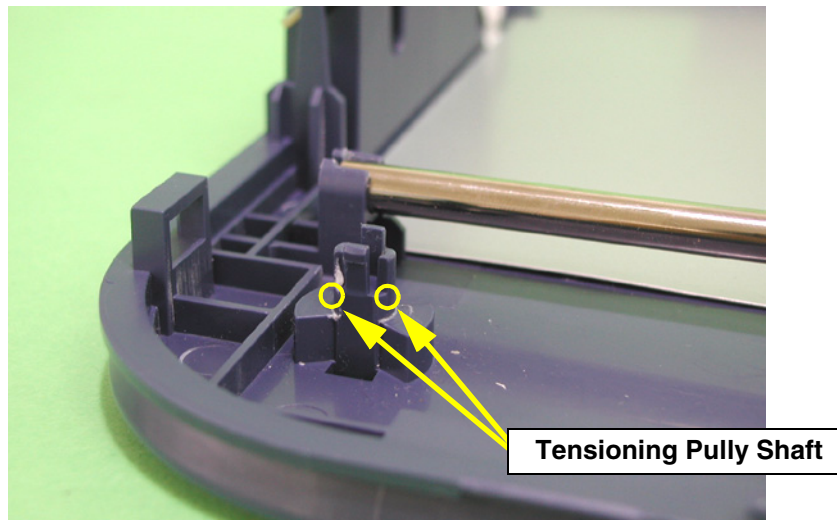


Figure 5-2. Lubrication Point

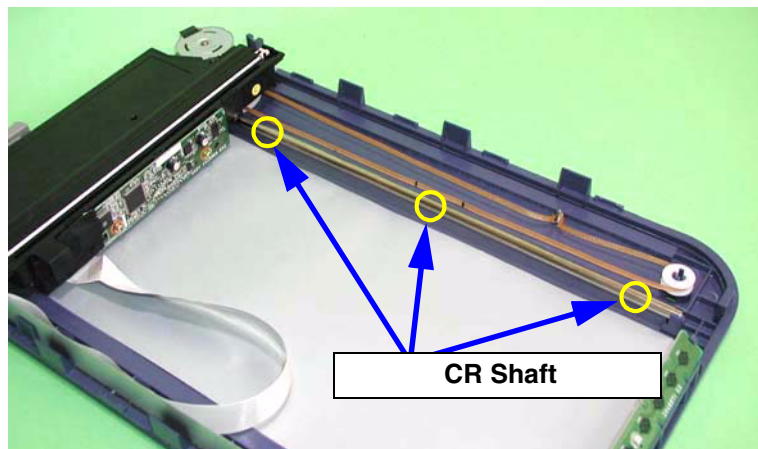


Figure 5-3. Lubrication Point

**CHAPTER**

**6**

**APPENDIX**





## 6.1 Specifications

This chapter provides additional information that may be useful when servicing the scanner.

### 6.1.1 Basic specifications

Type	Desktop color image scanner
Scanning method	Fixed bed document scanning with movable scanning head
Image scanning device	Color CCD line sensors (3-line type)
Scanning area	A4 (US Letter)
Max. effective area	8.5" x 11.7" (216 mm x 297 mm)
Max. effective resolution	10,200 x 14,040 dots (1200 dpi)
Resolution	Main: 1200 dpi Sub: 2400 dpi
Output resolution	50 – 4800 dpi (setting in units of 1 dpi possible) 7200 dpi, 9600 dpi
Gradations	All pixels/all colors: 16-bit (input) 1-bit or 8-bit (output)
Color separation method	Color CCD
Scanning speed	Black & White: Approx. 12 msec./line 256 grayscale: Approx. 36 msec./line Full color: Approx. 36 msec./line (A4, 1200 dpi, high-speed scanning, not including data transmission time)
Command level	ESC/I-D2

Size	10.9" (W) x 17.2" (D) x 2.6" (H) 278 (W) x 438 (D) x 67 (H) mm
Weight	Approx. 5.5 pounds (2.5 kg)
Image processing functions	
■ Gamma correction	User-defined correction table setting
■ Image output data	8-bit or 1-bit
Interface	USB (B connector - 1 receptacle)
Light source	White cold-cathode fluorescent lamp
Power switch	None
Indicator LEDs	Two-color LEDs
Option	TPU
Scanning time	PC (A4 size using a Pentium-3, 550 MHz, 256 MB or more PC) 600 dpi: 175 seconds or less 1200 dpi: 800 seconds or less
Operating Systems	<ul style="list-style-type: none"> <li>• Windows 98</li> <li>• Windows 2000 Pro</li> <li>• Windows ME</li> <li>• Macintosh System 8.5 or higher (with standard USB port)</li> <li>• Post-release support is planned for MAC OS X and Windows XP</li> </ul>
Hub	The device must be connected to a tier 1 hub.

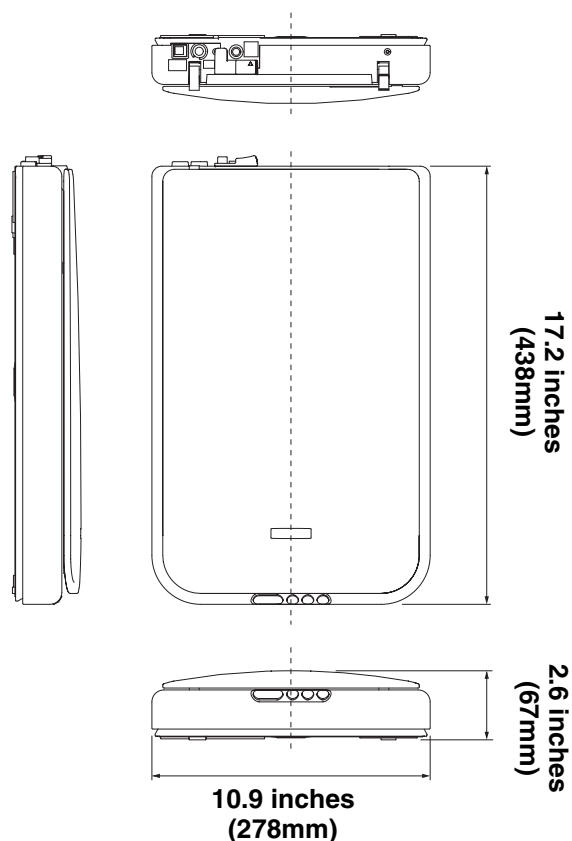


Figure 6-1. Scanner Dimensions

### 6.1.2 Basic TPU specifications

Light source	White cold-cathode fluorescent lamp
Max. scanning area	1.4" x 1.4" (36 mm x 36 mm)
Document sizes	35 mm strip film (positive, negative) 35 mm slides (positive, negative)
Dimensions	3.4" (W) x 5.7" (D) x 2.2" (H) 88 (W) x 145 (D) x 56 (H) mm
Weight	Approx. 0.66 pounds (0.3 kg)

### 6.1.3 Electrical specifications

#### Scanner electrical characteristics

- Rated input voltage 15.2 V DC
- Rated power
 

Operation:	Approx. 18 W
Standby:	Approx. 5 W
Energy saving mode:	Approx. 10 W
- Rated input current 1.2 A/15.2 V DC

#### AC adapter electrical characteristics

- Power supply voltage Rated: 100 V AC  $\pm$  10%
- Rated input current 0.4 A
- Power supply frequency Rated: 50/60 Hz (49.5-60.5 Hz)
- Rated output voltage 15.2 V DC
- Rated output current 1.2 A
- Insulation resistance 10 M $\Omega$  or higher at 500 V DC (between AC line and chassis)
- Dielectric resistance 1200 V AC for 1 minute (between AC line and chassis)

## TPU electrical characteristics

- Rated input voltage      15 V DC
- Rated power supply      Operation: Average 4 W  
   Standby:    Average 0 W
- Rated input current      0.3 A

**6.1.4 Resistance to electrical noise**

Static electricity	Panel	No errors at 10 kV or less No damage at 15 kV or less
	Metallic parts	No errors at 7 kV or less No damage at 15 kV or less
	Test conditions	Constants: 150 $\Omega$ , 150 pF
Voltage	3 – 15 kV	
Cycles	120	

**6.1.5 Operating environment**

Temperature	Operation:	41°F – 95°F (5°C – 35°C)
	Storage:	-13°F – 140°F (-25°C – 60°C)
Humidity	Operation:	10% – 80% (no condensation)
	Storage:	10% – 85% (no condensation)

**6.1.6 Reliability**

Main unit	MCBF carriage oscillation10,000 cycles
Main unit light source	MTTF 5000 hours
TPU	Light source MTTF5000 hours

**6.1.7 Documents**

Reflective documents      Smooth surfaced documents

Transparent documents    Negative and positive films can be scanned  
using the separate transparency unit

## 6.2 Interface Specifications

This scanner is equipped with a standard USB interface as described below.

### 6.2.1 USB Interface

The scanner has the following configuration specifications.

Device	Max. packet size or end point 0: 8 bytes Vendor ID: 0x04B8 Product ID: 0x010F No. of connectors: 1
Configuration	Interfaces supported: 1 <i>Characteristics</i> <ul style="list-style-type: none"> <li>• Self-powering</li> <li>• Remote</li> <li>• Wake-up function not yet supported</li> <li>• Bus power consumption: 2 mA</li> </ul>
Interface 0	Alternate setting values: None No. of end points: 3
End point 1	Interrupt IN transfer Max. packet size: 1 byte
End point 2	Bulk In transfer Max. packet size: 64 bytes
End point 3	Bulk out transfer Max. packet size: 64 bytes
String descriptor	Manufacturer's name: "EPSON" Product name: "Perfection 1250/1250 PHOTO"

Electrical specifications    Conforms to high-speed (12 Mbps) mode specifications in the Universal Serial Bus specifications Revision 1.1

Connector

B receptacle x 1

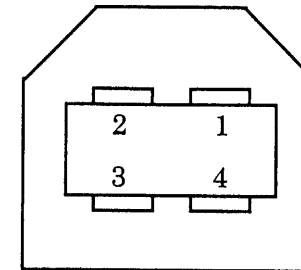


Figure 6-2. B Receptacle Pin Layout

Pin No.	Signal
1	VCC
2	-Data
3	+Data
4	GND

## 6.3 Control Codes

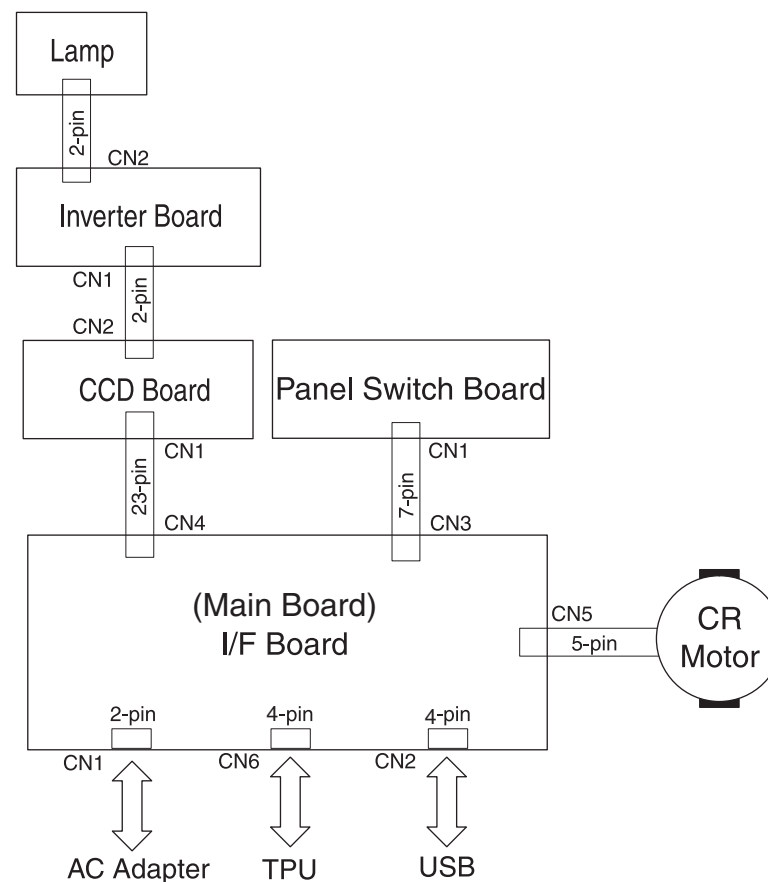
The command level for this scanner is ESC/I-D2. The commands supported by the scanner are shown in the following table.

**Table 6-1. Control Codes**

Category	Command Name	Code
Executable commands	ID request	ESC I
	ID2 request	ESC i
	Status request	ESC F
	Expansion status request	ESC f
	Scanning start	ESC G
	Pushbutton status request	ESC !
Data form setting	Data format setting	ESC D i
	Resolution setting	ESC R n1 n2
	Scanning area setting	ESC A n1 n2 n3 n4
	Color setting	ESC C i
Correction processing	Gamma correction setting	ESC Z i
	Gamma correction table setting	ESC z i d[256]
Auxiliary, other	Threshold value setting	ESC t i
	Scanning mode	ESC g i
	Initialization	ESC @
	Option control	ESC e i
	Line counter setting	ESC d i
Control	Normal result	ACK
	Error result	NACK
	Scanning stop	CAN
	Header	STX

### 6.3.1 Scanner Connection Diagram

The scanner connection diagram is shown below.



**Figure 6-3. Connection Diagram**

### 6.3.2 Connector Summary

Connectors used in the scanner are listed below. For their pin assignments, refer to the tables listed in the right-hand column.

**Table 6-2. Connector Summary**

Board	Connector	Function	No. of Pins	Ref. Table
Main circuit board	CN1	AC input	2	6-3
	CN2	USB connector	6	6-4
	CN3	Panel circuit board	7	6-5
	CN4	CCD circuit board	23	6-6
	CN5	CR motor	5	6-7
	CN6	TPU	7	6-8
CCD circuit board	CN1	Main circuit board	23	6-3
	CN2	Inverter circuit board	2	6-9
Inverter circuit board	CN1	CCD circuit board	2	6-9
	CN2	Lamp	2	6-10
Panel circuit board	CN1	Main circuit board	7	6-5

### 6.3.3 Connector Pin Assignments

The pin assignments for circuit board connectors are shown in the following tables.

**Table 6-3. Main Circuit Board CN1**

Pin No.	Signal	I/O
1	+15VDC	I
2	GND	—

**Table 6-4. Main Circuit Board CN2**

Pin No.	Signal	I/O
1	VCC	I
2	–Data	I/O
3	+Data	I/O
4	GND	—

**Table 6-5. Main Circuit Board CN3**

Pin No.	Signal	I/O
1	5V	O
2	GREEN	O
3	RED	O
4	Push–SW1	I
5	Push–SW2	I
6	Push–SW3	I
7	Push–SW4	I

**Table 6-6. Main Circuit Board CN4**

Pin No.	Signal	I/O
1	+15V	O
2	GND	—
3	B#	I
4	B	I
5	A#	I
6	A	I
7	GND	—
8	SENSEB	O
9	SENSEA	O

Pin No.	Signal	I/O
10	HP	O
11	+15V	O
12	PM-SW4	O
13	PM-SW3	O
14	PM-SW2	O
15	PM-SW1	O
16	+5V	O
17	DETECT	O
18	OP-LED	I
19	ERR-LED	I
20	GND	—
21	+Data	I/O
22	–Data	I/O
23	TPU	I

Table 6-7. Main Circuit Board CN5

Pin No.	Signal	I/O
1	MOTB#	O
2	MOTA#	O
3	MOTB	O
4	MOTA	O
5	+15V	O

Table 6-8. Main Circuit Board CN6

Pin No.	Signal	I/O
1	+15V	O
2	TPU_DETECT	I
3	NC	—
4	GND	—

Table 6-9. CCD Circuit Board CN2

Pin No.	Signal	I/O
1	+LSV	O
2	GND	—

Table 6-10. Inverter Circuit Board CN2

Pin No.	Signal	I/O
1	+25V	O
2	INV-GND	—

## **6.4 Circuit Diagram**

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The following pages show the circuit diagrams for the scanner's control circuits.

- Main (interface) Board
- CCD Board



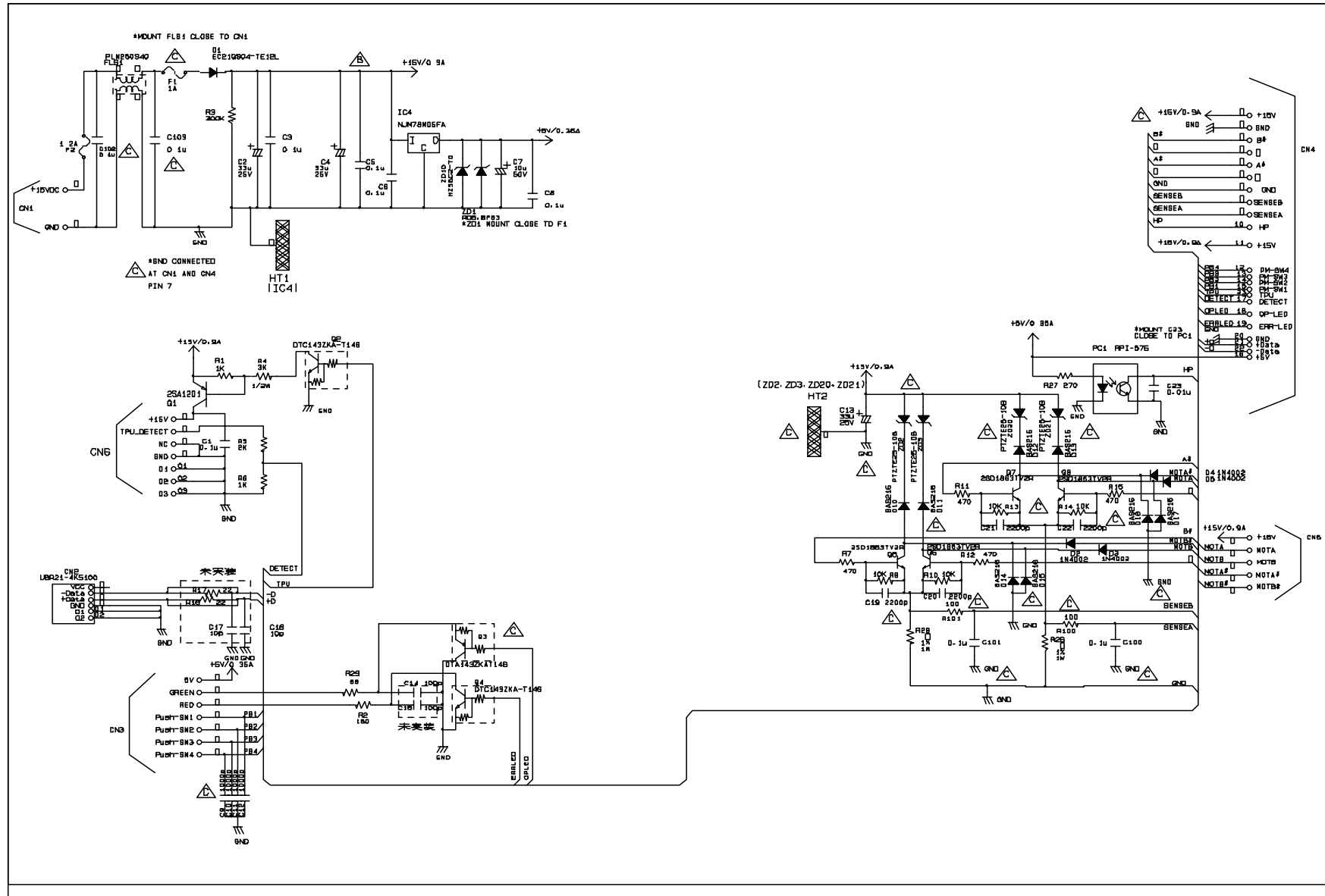


Figure 6-4. Main (interface) Board

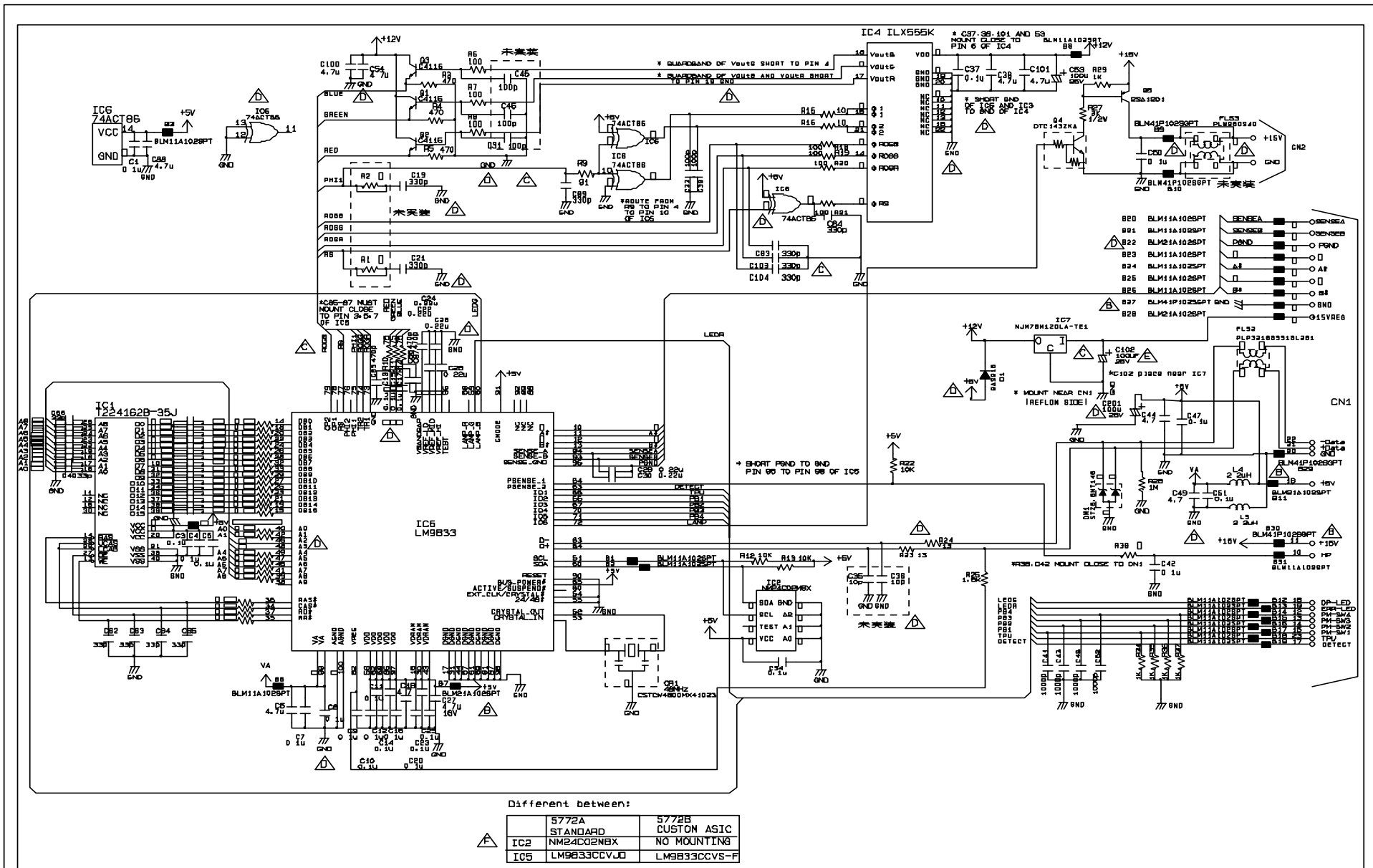


Figure 6-5. CCD Board

## 6.5 Parts List and Exploded Diagrams

Table 6-11. Parts List

Part No.	Part Name
100	MAT,COVER,DOCUMENT
101	HOUSING,LOWER
102	COVER,DOCUMENT
103	LOCK,CARRIAGE
104	FOOT
105	DOUBLE SIDED TAPE,305X10
106	LOGO PLATE 10X40;C
107	HOUSING ASSY,UPPER;ASP
200	BOARD ASSY.,I/F
201	BOARD ASSY.,PNL
202	HARNESS,IF-PNL
CN4	CONNECTOR
D1	SCHOTTKY BARRIER DIODE
FLS1	CHOKE COIL
IC4	IC
Q2	TRANSISTOR
Q3	TRANSISTOR
Q4	TRANSISTOR
400	POWER CABLE
401	AC ADAPTER
500	SHAFT,CR
501	TIMING BELT
502	TORSION SPRING,47

Table 6-11. Parts List

Part No.	Part Name
503	PULLEY,DRIVE
504	PULLEY,DRIVEN
505	SHIELD,BASE
506	SHIELD,VERTICAL
507	SHIELD,BASE,BOARD
508	SHIELD,REAR
509	SHIELD,FRONT
510	HOLDER ASSY.,MOTOR
511	CR MOTOR
512	CARRIAGE ASSY.
01	INDIVIDUAL CARTON BOX,FOR AMERICA
02	PAD,SCANNER,FRONT
03	PAD,SCANNER,REAR
800	TPU ASSY
801	35MM FILM STRIP HOLDER
802	35MM SLIDE HOLDER

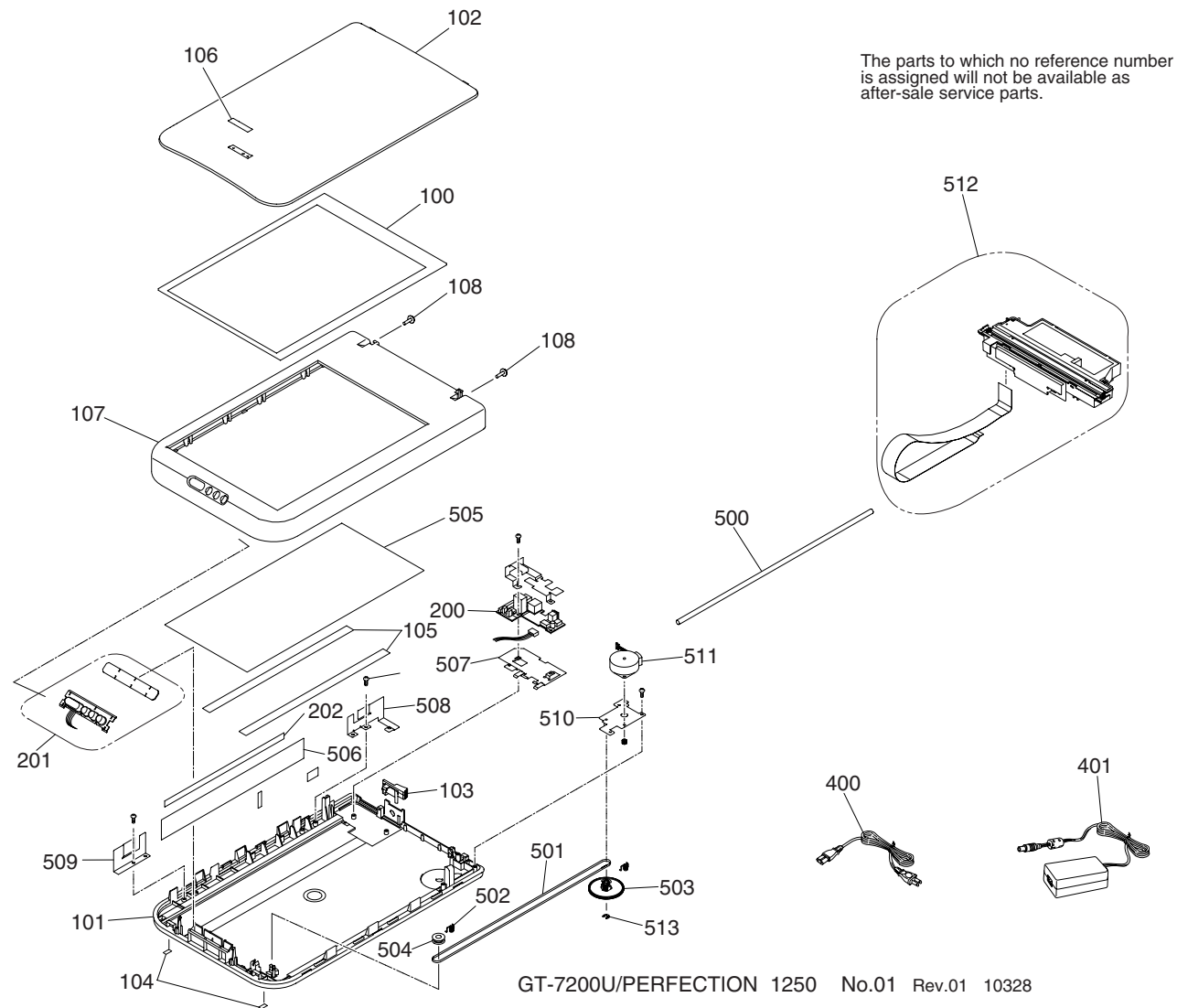
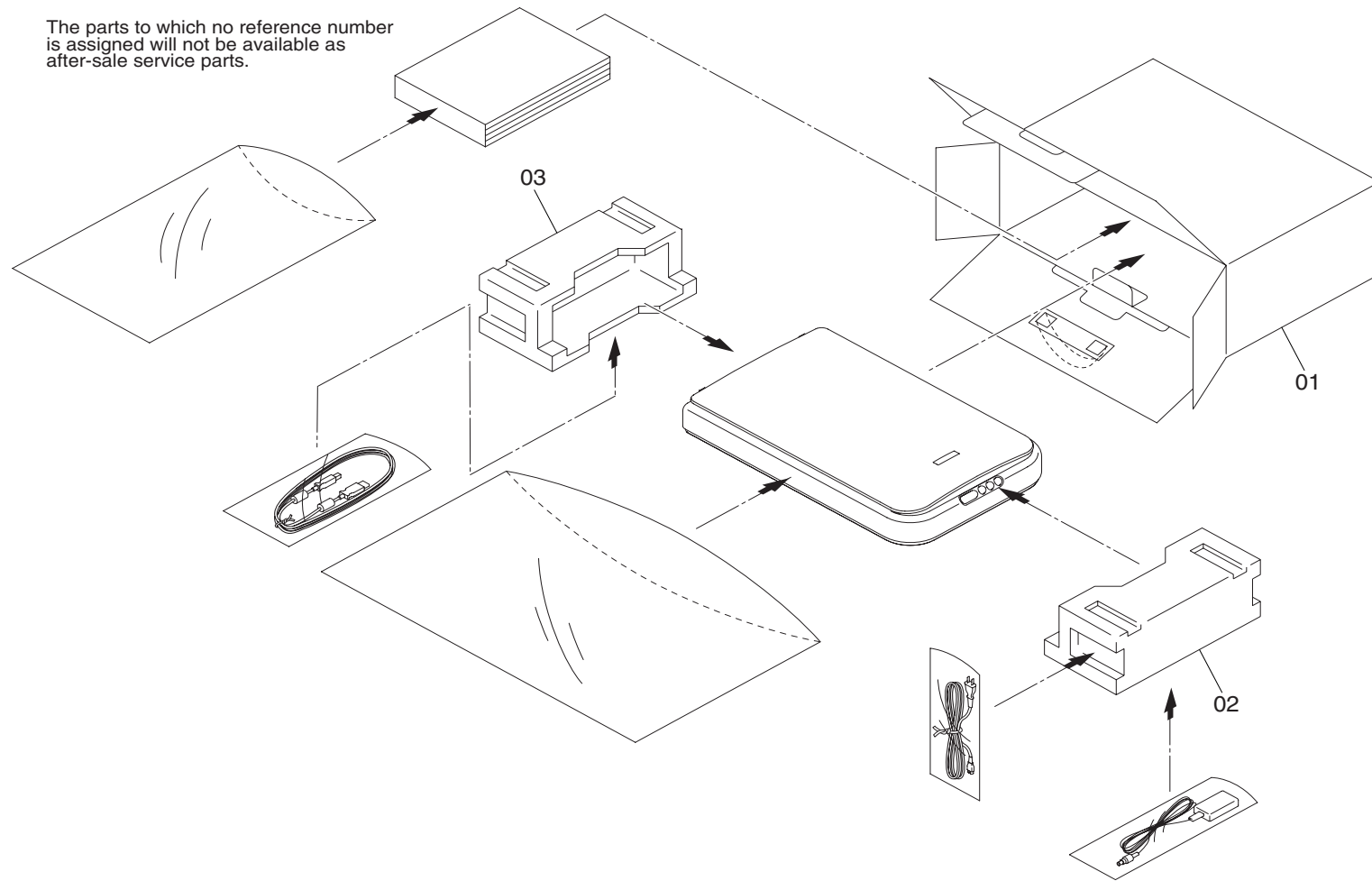
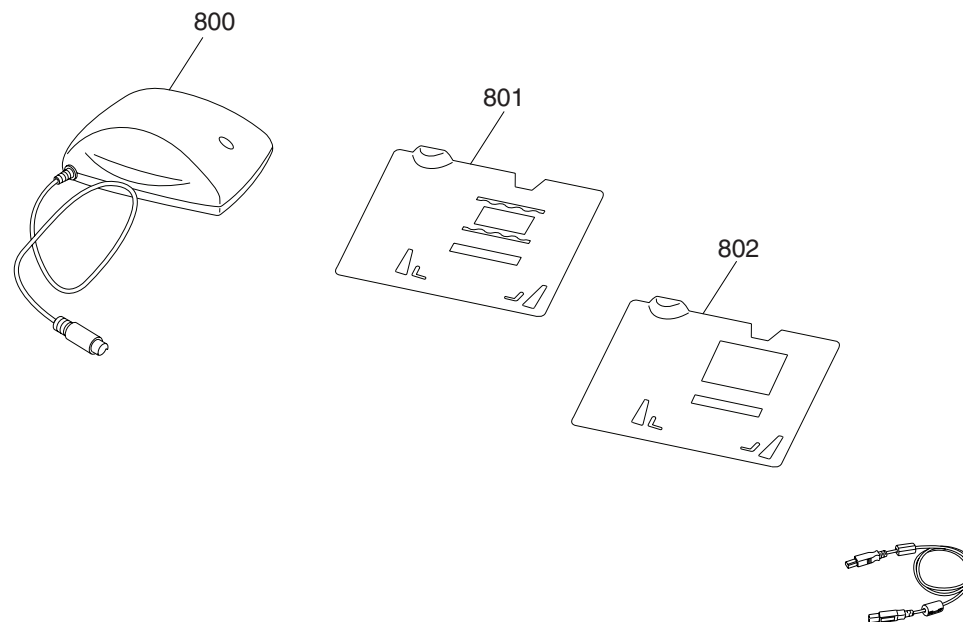


Figure 6-6. Exploded Diagram (1)



GT-7200U/PERFECTION 1250 No.02 Rev.01 10328

Figure 6-7. Exploded Diagram (2)



PERFECTION 1250 PHOTO No.03 Rev.01 10328

**Figure 6-8. Exploded Diagram (3)**